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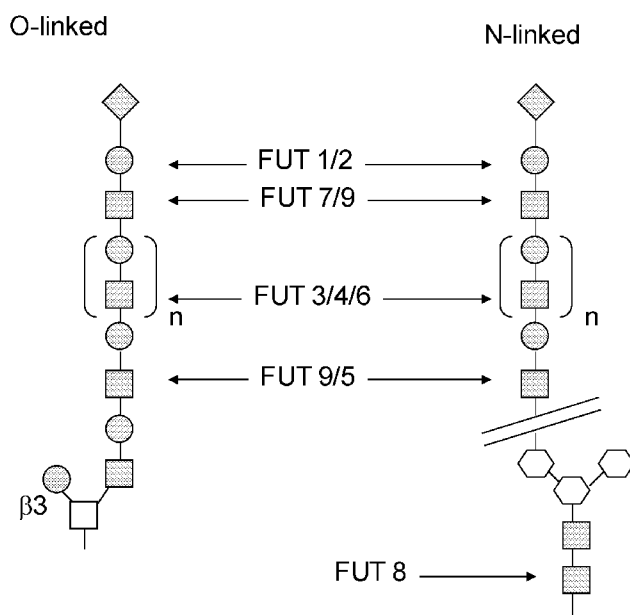
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WASHBURN, Nathaniel, J. [US/US]; 543 King Street,
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EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU,
LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,

[Continued on next page]

(54) Title: ANTENNARY FUCOSYLATION IN GLYCOPROTEINS FROM CHO CELLS

FIGURE 1

(57) Abstract: The present invention provides methods of
evaluating CHO cells and producing recombinant glyco-
proteins. The method of evaluating CHO cells is carried
out providing one or more CHO cells from the population
and measuring glycans containing antennary fucose
residues produced by said cells, wherein the CHO cells
have not been genetically engineered to express an alpha 3
/ alpha 4 antennary fucosyl - transferase coding sequence.



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INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER

INV. G01N33/53 G01N33/68
ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

G01N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal, BIOSIS, EMBASE, INSPEC, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	STANLEY P ET AL: "The LEC11 Chinese hamster ovary mutant synthesizes N-linked carbohydrates containing sialylated, fucosylated lactosamine units. Analysis by one- and two-dimensional 1H NMR spectroscopy.", THE JOURNAL OF BIOLOGICAL CHEMISTRY 15 AUG 1988 LNKD- PUBMED:3403533, vol. 263, no. 23, 15 August 1988 (1988-08-15), pages 11374-11381, XP002620492, ISSN: 0021-9258 the whole document In particular: Title; Abstract; Materials and methods section; Table I; p. 11380, col. 1-2, bridging paragraph ----- -/--	1-50



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No

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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ITO S ET AL: "Structural analysis of a glycoprotein by liquid chromatography-mass spectrometry and liquid chromatography with tandem mass spectrometry - Application to recombinant human thrombomodulin", JOURNAL OF CHROMATOGRAPHY, ELSEVIER SCIENCE PUBLISHERS B.V, NL, vol. 978, no. 1-2, 29 November 2002 (2002-11-29), pages 141-152, XP004389638, ISSN: 0021-9673, DOI: DOI:10.1016/S0021-9673(02)01423-1 the whole document In particular: Abstract; Experimental section; Fig. 2-9; Table 1 and 3. -----	1-50
X	WO 2007/022799 A1 (ARES TRADING SA [CH]; FISCHER DINA [IL]; BERNARD ALAIN [FR]; DUCOMMUN) 1 March 2007 (2007-03-01) the whole document In particular: Examples 1, 2 and 5; Fig. 3-5. -----	1-50
A	WO 2008/128228 A1 (MOMENTA PHARMACEUTICALS INC [US]; COLLINS BRIAN EDWARD [US]; BOSQUES C) 23 October 2008 (2008-10-23) the whole document In particular: p. 38-40, examples 1-3; Figures 1-7. -----	1-50
A	USHIDA Y ET AL: "Structures of the sugar chains of recombinant macrophage colony-stimulating factor produced in Chinese hamster ovary cells.", JOURNAL OF BIOCHEMISTRY JUL 1997 LNKD-PUBMED:9276682, vol. 122, no. 1, July 1997 (1997-07), pages 148-156, XP002620493, ISSN: 0021-924X the whole document In particular: Title; Abstract; Materials and methods section; Tables V and VIII. -----	1-50
A	US 2002/137673 A1 (PINGEL HANS KURT [DK] ET AL) 26 September 2002 (2002-09-26) the whole document In particular: paragraphs 18, 54, 98-139. ----- -/--	1-50

INTERNATIONAL SEARCH REPORT

International application No

PCT/US2010/058872

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SUSAN F. WHEELER ET AL.: "Comparison of the N-linked glycans from soluble and GPI-anchored CD59 expressed in CHO cells.", GLYCOBIOLOGY, vol. 12, no. 4, 1 April 2002 (2002-04-01), pages 261-271, XP55000080, the whole document -----	1-50
A	STANLEY P: "Lectin-resistant CHO cells: selection of new mutant phenotypes.", SOMATIC CELL GENETICS SEP 1983 LNKD-PUBMED:6623313, vol. 9, no. 5, September 1983 (1983-09), pages 593-608, XP008136983, ISSN: 0098-0366 the whole document In particular: Materials and methods section. -----	1-50
T	Anonymous: "Genetic engineering", Wikipedia, the free encyclopedia 1 January 2011 (2011-01-01), XP55000098, Retrieved from the Internet: URL:http://en.wikipedia.org/wiki/Genetic_engineering [retrieved on 2011-05-24] the whole document -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2010/058872

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fees, this Authority did not invite payment of additional fees.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

1-50
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☒ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-25

A method for evaluating a CHO cell population as defined in claim 1.

2. claims: 26-37

A method for screening one or more CHO cells for the ability to produce glycoproteins comprising glycans containing antennary fucose as defined in claim 26.

3. claims: 38-50

A method for screening one or more CHO cells for the ability to produce glycoproteins comprising glycans containing antennary fucose as defined in claim 26.

4. claims: 51-57

A method of producing a glycoprotein having a target level of antennary fucosylation.

5. claims: 58, 59

A recombinant glycoprotein produced in CHO-K1 cells or a derivative thereof.

6. claim: 60

An isolated population of CHO-K1 cells.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/058872

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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